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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Joon Mo Kang

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04/20/2006

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EXAMINER

KIANNI, KAVEH C

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No.	Applicant(s)	
	10/727,201	MO KANG ET AL.	
	Examiner	Art Unit	
	Kianni C. Kaveh	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) 58-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's canceling of claims 17-57 in the amendment/response submitted on 2/02/06 is acknowledged.

Newly submitted claims 58-74 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the originally presented claims, Group Ra, claims 1-16, are directed to including the step of forming a patterned sacrificial portion over upper and lower cladding portions; while the newly presented claims, Group Rb, claims 58-74 are directed to including wherein the waveguide portion comprises at least one waveguide core embedding within at least another waveguide portion. Thus, each of the above group inventions directed to an invention that is distinct, and requires a different search, than that of other invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 58-74 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

Claim 1 is objected to because of the following informalities: the newly inserted limitation portion 'of the' immediately after the newly inserted limitation 'exposed second portion', in line 10, is not underlined. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 2-16 depend on claim 1 and therefore they are also rejected.

Claim 1 recites the limitation 'the exposed second portion' in lines 10 and 15. There is insufficient antecedent basis for such limitation in the claim. Correction is required.

The limitation step 'to form a planarized cladding portion coplanar with the unpper surface of the waveguide core portion; to form the substantially planar surface of an optical waveguide device are ambiguous and undefined limitations as what these steps are actually accomplishing not positively cited limitation as Claim 1 is ambiguous

The limitation step 'planarizing' in line 14th of claim 1 is undefined. The applicant must stipulate what is being planarized and whether it comprises or it includes or consists 'the step of:' that would related to the subsequent sub-steps.

The semicolon in line 16 of claim 1 has made the step 'the lower cladding portion' in line 17, undefined/ambiguous. Otherwise, if the limitation of line 17 is an independent step then it needs to be defined as what the actual step is or accomplishing. Correction is required.

The semicolon in line 20 of claim 1 has made the step 'to form the substantially planar surface of an optical waveguide device' in line 21, undefined/ambiguous. Otherwise, if the limitation of line 21 is an independent step then it needs to be defined as what the actual step is or accomplishing. Correction is required.

- *The examiner called the applicant on 4/3/06 to clarify and/or give advice on portions of claim 1, but did not receive any response as of 4/4/06.*

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if its base claim no longer is rejected under USC 12 Second paragraph and rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 5 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the waveguide core portion comprises at least one waveguide core embedding within at least another waveguide core in combination with the rest of the limitations of the base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 6-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davids et al. (US 20030161571).

Regarding claim 1, Davids teaches a method of forming a substantially planar surface of an optical waveguide device (shown in at least fig. 7-11 and see abstract), comprising the steps:

forming at least one waveguide core portion 32 within at least one cladding portion 24,50 (shown in at least fig. 10 and 7, item 32);

the waveguide core portion 32 having an upper surface (shown in at least fig. 7B and 10A, item upper surface of core 32);

the cladding portion having a higher portion 50 over at least the waveguide core portion 32 and a lower portion 24; forming a patterned sacrificial portion over the lower cladding portion 14 (see parag. 0015) and a portion of the higher cladding portion 50 (see parag. 0025), leaving a second portion of the higher cladding portion exposed (see fig. 9-10, item 50 and parag. 0025);

removing at least a portion of the exposed second portion of the higher cladding exposed portion by a selective removal process selective to the patterned sacrificial portion leaving a remaining of the higher cladding portion (see parag. 0080 and 0025); planarizing:

the remaining of the exposed second portion of the higher cladding exposed portion over the waveguide core portion (shown in at least fig. 10A and see parag. 0024 and 0087);

and the lower cladding portion (see parag. 0014 and 0087); to form a planarized cladding portion 50 coplanar with the upper surface of the waveguide core portion 32; to form the substantially planar surface of an optical waveguide device (shown in at least fig. 10, item planar waveguide device with the upper surface of the waveguide core portion 32; also see at least parag. 0087).

However, Davids does not explicitly state that the above remaining portion is 'remnant portion'. It is obvious/well-known to those ordinary skill in the art when the invention was made that 'the remaining portion' is/known as 'remnant portion', since such planar waveguide would provide an integrated waveguide device with high speed, low loss and high gain characteristics (see parag. 0004).

Regarding claims 3-4 and 6-16, Davids further teaches wherein the predetermined thickness is between about 0 and 200 nm (see at least parag. 0012); wherein the cladding portion has a first index of refraction, the waveguide core portion has a second index of refraction; and the waveguide core portion second index of refraction is greater than the cladding portion first index of refraction (see at least

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parag. 0002 and 0010); wherein the planarization is a chemical mechanical polishing process (see parag. 0014); wherein the patterned sacrificial portion is comprised of: photoresist; or photoresist stacked upon a film comprised of: silicon nitride, silicon oxynitride organic silicate glass, diamond like carbon, silicon dioxide, polyimide, PMMA, tantalum, tungsten or molybdenum (see at least paarg. 0015 and 0019 see at least photoresist); wherein the cladding portion is comprised of silicon nitride, organic silicate glass, silicon dioxide, polyimide or PMMA (see at least parag. 0014); wherein the selective removal process selective to the patterned sacrificial portion is a dry and/or wet etching process (see parag. 0013); wherein the patterned sacrificial portion is removed before the planarization (see at least parag. 0015); wherein the sacrificial portion is photoresist and the patterned sacrificial photoresist portion is removed before the planarization by a stripping process (see at least parag. 0015); wherein the waveguide core portion is formed using a first mask (see at least parag. 0019); and the patterned sacrificial portion is patterned from a sacrificial layer using a second mask that is the reverse of the first mask (see at least parag. 0030); wherein the planarization also removes any remaining patterned sacrificial portion (shown in at least fig. 10A, and 8c, item removing any remaining of sacrificial layer); wherein waveguide core portion is formed using a first mask (see at least parag. 0019); and not all the sacrificial portion area is needed to be patterned using a second mask that is the reverse of the first mask (see at least parag. 0019 and 30; note also that no patentable weight can be given to a/this negatively cited limitation); wherein the patterned sacrificial portion is also removed during the planarization (see at least

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parag. 0019); wherein the planarization includes a fine planarization process (see at least parag. 0014 and 0024, wherein fine planarization is implemented through chemical processing analogous to that of the claimed invention-- in the specification); wherein the planarization of the remaining of the exposed second portion of the higher cladding portion over the waveguide core portion and the lower cladding portion does not expose the upper surface of the waveguide core portion (see at least parag. 0014 and 0024; note also that no patentable weight can be given to a/this negatively cited limitation).

Response to Arguments and Amendment

Applicant's argument filed on 19/17/05 have been fully considered but they are not persuasive.

Applicant alleges (page 14, 3rd parag.) that Davis does not teach removing at least a portion of the exposed second portion of the higher cladding exposed portion by a selective removal process selective to the patterned sacrificial portion leaving a remaining of the higher cladding portion; planarizing: the remaining of the exposed second portion of the higher cladding exposed portion over the waveguide core portion; and the lower cladding portion; to form a planarized cladding portion coplanar with the upper surface of the waveguide core portion; to form the substantially planar surface of an optical waveguide device. The Examiner responds that such limitations are clearly taught by Davis et al. removing at least a portion of the exposed second portion of the higher cladding exposed portion by a

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selective removal process selective to the patterned sacrificial portion leaving a remaining of the higher cladding portion (see parag. 0080 and 0025); planarizing: the remaining of the exposed second portion of the higher cladding exposed portion over the waveguide core portion (shown in at least fig. 10A and see parag. 0024 and 0087); and the lower cladding portion (see parag. 0014 and 0087); to form a planarized cladding portion 50 coplanar with the upper surface of the waveguide core portion 32; to form the substantially planar surface of an optical waveguide device (shown in at least fig. 10, item planar waveguide device with the upper surface of the waveguide core portion 32; also see at least parag. 0087).

THIS ACTION IS MADE FINAL

This action in response to applicant's amendment made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kianni C. Kaveh whose telephone number is 571-272-2417. The examiner can normally be reached on 9:30-19:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Cyrus Kianni
Primary Patent Examiner
Group Art Unit 2883



April 4, 2006

**KAVEH KIANNI
PRIMARY EXAMINER**